

PEYERIMHOFFINA GRACILIS
(SCHNEIDER, 1851) (NEUR.: CHRYSOPIDAE):
A GREEN LACEWING NEW TO BRITAIN

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THERE ARE CURRENTLY 66 species of Neuroptera recorded from the British Isles. Of these, eight species (12% of the British fauna) have been recorded for the first time in Britain since 1988 (Plant, 1997). In part, this plethora of new records is due to a recent upsurge of interest in the group following the launch of the Neuroptera Recording Scheme in 1988. This has resulted in the discovery of at least four species that were probably previously overlooked residents. However, it is thought that two additional species are probably recent colonists to this country (Plant, 1997).

Green lacewings (Chrysopidae) is one of the largest neuropteran families and Plant (1997) listed 19 species from Britain, two of which (*Cunctochrysa bellifontensis* Leraut and *Nineta inpunctata* (Reuter)) have been recorded for the first time in Britain since 1993. Chrysopids occur in a wide variety of biotopes including dune systems, grasslands, scrub, gardens, and deciduous and coniferous woodlands. The larvae are predaceous, feeding on soft-bodied insects, such as aphids, coccids and lepidopteran eggs and larvae, which they encounter whilst foraging on foliage. As adults, most chrysopids feed on honey-dew, nectar or pollen, but species in the genera *Chrysopa* and *Nineta* are insectivores. Most species are attracted to light, but some are best collected by beating foliage. A few, such as *Nothochrysa capitata* (Fabricius) live in the canopy of oak trees and so are collected infrequently, although in fact they may be locally common (Barnard *et al.*, 1986).

During September 1999, a series of water traps releasing the two aphid sex-pheromone compounds (4aS,7S,7aR)-nepetalactone and (1R,4aS,7S,7aR)-nepetalactol (see Hardie *et al.*, 1999) were set up to capture male aphids as part of an on-going study at Silwood Park, near Ascot, Berkshire, UK (51°25'N: 1°19'W). The water traps were made from clear plastic 14 centimetre Petri dishes, mounted on 1.1 metre poles and filled with a clear, odourless, detergent solution (Hardie *et al.*, 1991). They were situated in sheltered, but open positions close to the edge of mature deciduous woodland consisting primarily of oak *Quercus robur*, but including hawthorn *Crataegus monogyna*, field maple *Acer campestre* and spindle *Euonymus europaeus* as well as Scots pine *Pinus sylvestris* and *Cupressocyparis x leylandii*. Amongst the insects collected in the traps were 39 adult male green lacewings. At first sight these appeared to be a species of *Chrysoperla* but they could not be

keyed out satisfactorily in Plant (1997). Comparison with descriptions in Aspöck *et al.* (1980), Brooks & Barnard (1990) and with specimens in the Neuroptera collections of The Natural History Museum, London, showed that they were *Peyerimhoffina gracilis* (Schneider) (formerly in the genus *Tjederina*). Subsequent trapping during May-December 2000 recorded adult *P. gracilis* between 12 June and 15 October, with further trapping during February 2001 producing over-wintered adults from 12 February onwards.

Distribution and biology

Peyerimhoffina gracilis has a distinctly circum-Mediterranean and eastern European distribution. The species occurs in the Pyrenees, southern and eastern France, central and eastern Germany, Switzerland, Austria, Hungary, Romania, Ukraine, Corsica, southern Italy, Greece, Yugoslavia, north-west Turkey, Morocco, Algeria and Tunisia. The previous most northerly records were from the southern Netherlands (Lacroix, 1920; Aspöck *et al.*, 1980). *Peyerimhoffina gracilis* typically occurs in relict pine forests with fir *Abies numidica*, spruce *Picea abies* and Scots pine at altitudes between 100-1600 m. In Spain it has been recorded from silver fir *Abies alba*, Scots pine *Pinus sylvestris* and holly *Ilex aquifolium* (Montserrat & Marin, 1994). Adults occur between February and December and the insect over-winters in the adult stage. There may be one or two generations per year (Lacroix, 1920; Zelený, 1984). Eggs are laid solitarily (Gepp, 1984).

Peyerimhoffina gracilis seems to be well established at Silwood Park, since it was recorded at seven separate sites sampled during 2000, although the plants with which it is usually associated are not particularly common there. It also appears to be a fairly recent colonist since the Neuroptera of Silwood Park are thought to be fairly well known. Hollier & Belshaw (1992; 1993) failed to record it at Silwood Park and their specimens have recently been re-examined by Colin Plant, however it was also absent from terrestrial Malaise traps set near the study sites during May and June 2000. The species may have been introduced inadvertently into Britain with plants from Eastern Europe or the Mediterranean. There is also the possibility that the species is a recent colonist, perhaps resulting from a northward range expansion in response to climatic warming similar to that of a number of other European insect species (Parmesan *et al.*, 1999; Burton, 2001). The presence of one specimen of *P. gracilis* in a suction trap, positioned at a height of 12 metres and in open grassland 100 metres from woodland edge on 10 September 2000 at Silwood Park, suggests that the species may be fairly mobile. However, Duelli (1984) suggests that since the species is usually only locally common it is unlikely to perform adaptive dispersal flights, so it might be expected to be a slow coloniser. The absence of records of such a distinctive species from museum collections of British Neuroptera suggests that the species is not a well-established, but over-looked, resident.

Identification

Peyerimhoffina gracilis is superficially similar to species of *Chrysoperla*, which also have narrow wings, but *P. gracilis* is smaller and more robust (Plate H). However, *P. gracilis* can be readily distinguished from *Chrysoperla* and all other green lacewings by two characters, which are apomorphic for the genus (Brooks & Barnard, 1990). In the forewing there are more crossveins in the inner gradate series than the outer (the gradates form a paired series of crossveins in the apical half of each wing), and in both sexes the tip of the abdomen (the ectoprocts) are acutely pointed. The genus includes two species (although *P. pudica* Lacroix is of doubtful validity), and appears to be closely related to *Chrysoperla* with which it shares narrow wings, a short intramedian cell and sinuous basal costal crossveins. Other characters, which distinguish the species from most other British chrysopids, are the lack of a basal dilation on the tarsal claw and the long, thickened, green or pale brown pterostigma.



Plate H. *Peyerimhoffina gracilis* (Schneider). Male. Photograph © R. H. J. Verkerk

To identify *P. gracilis* correctly, the key to British Neuroptera (Plant, 1997, Key H, page 221 - 231), should be modified by adding a new couplet 3, on page 222:

- 3 Inner gradate series of fore wing with at least twice as many crossveins as in outer gradate series (usually 4 inner gradates; 2 outer gradates). Tip of abdomen acutely pointed..... *Peyerimhoffina gracilis*
 — Inner gradate series of fore wing with fewer crossveins than in outer gradate series. Tip of abdomen rounded Old couplet 3

Diagnosis

Ground colour: green with black markings.

Head: broad black stripe on gena and lateral clypeus; red stripe between eye and base of antenna; maxillary and mandibular palp entirely black; scape (referred to as the first antennal segment in Plant, 1997) with narrow outer lateral stripe; second antennal segment with black ring; antenna shorter than fore wing, antennal segments green in basal half, black in distal half.

Thorax: median yellow stripe; dorsal setae short, dark.

Legs: unmarked; tarsal claw without basal dilation.

Fore wing: length 9-10 mm; narrow (length : breadth = 3.5-4.0 : 1); unmarked; costal area narrow at base; costal setae short, inclined apically; basal costal crossveins sinuous; stigma long, thickened, green or pale brown; intramedian cell (im) short, narrow, ovate; 1st Rs crossvein meets im at, or just basal to, or just proximal to, apex of cell; gradate crossveins in two parallel series; basal inner gradate meets the pseudomedian vein (Psm); at least twice as many inner gradates as outer gradates (usually 4 inner gradates and 2 outer gradates).

Abdomen: marked with yellow median stripe; setae black, short, sparse; apex acutely pointed. Male and female genitalia described and figured by Aspöck *et al.* (1980) and Brooks & Barnard (1990).

Larva: narrow, fusiform; thoracic and abdominal tubercles hardly developed; setae short; no debris carried (Gepp, 1983).

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Parasitoid *Meteorus gyrator* (Thunb.) (Hym.: Braconidae: Meteorinae) reared from larva of the White-spotted Pinion moth *Cosmia diffinis* (L.)(Lep.: Noctuidae) in Cambridgeshire

On 28 May 2000, I found an early instar larva of the White-spotted Pinion moth *Cosmia diffinis* about 1 cm in length, while searching for spinings of this species among the leaves of epicormic growth in a stand of tall roadside elms *Ulmus* sp.. The trees were bordering a cattle field at Boxworth, Cambridgeshire, a site reported to me by John Chainey. The larva was just above head height, but within reach of the ground and the spinning was discovered by looking up into leaves at this height. The elms form a shelterbelt several trees deep and the larva was on a tree in the centre of the shelterbelt in only dappled sunlight, not on the edge of the stand (Plate I, Fig. 1). During an hour spent beating and searching with Rachel Thomas and David Hastings, this was the only larva of *C. diffinis* found. I looked forward to rearing the larva to adult to confirm its identity and to studying its feeding and spinning behaviour. However, only a few days later, on 6 June 2000, a single grub of a parasitic wasp emerged from the small larva and spun a cocoon attached to an elm leaf by the corpse of its host.

I determined the young larva as of *C. diffinis* and not *C. affinis* on the basis that its black head does not show a trace of green, that it does not have a black thoracic plate, it has the pale translucent body colour and the details of the